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EXAMINER  
J 69558/182

DEPARTMENTAL PAPER NUMBER  
10

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DATE MAILED:  
2818

This is a communication from the examiner in charge of your application.  
COMMISSIONER OF PATENTS AND TRADEMARKS

09/17/96

☐ This application has been examined ☒ Responsive to communication filed on 6/26/96 ☒ This action is made final.

A shortened statutory period for response to this action is set to expire 3 month(s), 0 days from the date of this letter.  
Failure to respond within the period for response will cause the application to become abandoned. 35 U.S.C. 133

Part I THE FOLLOWING ATTACHMENT(S) ARE PART OF THIS ACTION:

- ☐ Notice of References Cited by Examiner, PTO-892.
- ☐ Notice of Draftsman's Patent Drawing Review, PTO-948.
- ☐ Notice of Art Cited by Applicant, PTO-1449.
- ☐ Notice of Informal Patent Application, PTO-152.
- ☐ Information on How to Effect Drawing Changes, PTO-1474.
- ☐

Part II SUMMARY OF ACTION

1. ☒ Claims 1-23 are pending in the application.

Of the above, claims are withdrawn from consideration.

~~2. ☒ Claims 1-23 have been cancelled.~~

3. ☒ Claims 8-11, 19 are allowed.

4. ☒ Claims 1-7, 12-18, 20-23 are rejected.

5. ☐ Claims are objected to.

6. ☐ Claims are subject to restriction or election requirement.

7. ☒ This application has been filed with informal drawings under 37 C.F.R. 1.85 which are acceptable for examination purposes.

8. ☐ Formal drawings are required in response to this Office action.

9. ☐ The corrected or substitute drawings have been received on Under 37 C.F.R. 1.84 these drawings are ☐ acceptable; ☐ not acceptable (see explanation or Notice of Draftsman's Patent Drawing Review, PTO-948).

10. ☐ The proposed additional or substitute sheet(s) of drawings, filed on has (have) been ☐ approved by the examiner; ☐ disapproved by the examiner (see explanation).

11. ☐ The proposed drawing correction, filed has been ☐ approved; ☐ disapproved (see explanation).

12. ☐ Acknowledgement is made of the claim for priority under 35 U.S.C. 119. The certified copy has ☐ been received ☐ not been received ☐ been filed in parent application, serial no. ; filed on

13. ☐ Since this application appears to be in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under Ex parte Quayle, 1935 C.D. 11; 453 O.G. 213.

14. ☐ Other

EXAMINER'S ACTION

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1. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
2. The objections to the specification and rejections of claims 1-7, 12-18 and 20 under 35 U.S.C. § 112, first paragraph, are withdrawn in view of persuasive arguments.
3. The objections to claims 1-7 and 9-18 under 35 U.S.C. § 112, second paragraph, are withdrawn in view of amendments.
4. Claims 1, 4, 12 and 15 are rejected under 35 U.S.C. § 103 as being unpatentable over Cline et al.

As to claims 1 and 12, Cline teaches a method and apparatus for detecting the presence of an object by radiation scanning (col 5, lines 36-40), identifying voxels having similar values of a property to identify a contiguous group (col 6, lines 4-51) and identifying the group as an object based on a characteristic (col 4, lines 34-37; also col 5, line 65 to col 6, line 3).

Although Cline et al does not perform the contiguity evaluation process in the same order as in the claims, it would have been obvious to one of ordinary skill in the art that the result would be identical in either case, as explained below in response to applicant's argument.

The statutory basis for this rejection has been changed from 35 USC § 102(b) to 35 USC § 103 to address the added limitations in the claims.

As to claims 4 and 15, it is inherent in computer axial tomography that scanning includes x-ray scanning (col 5, lines 37-38).

As to claims 21 and 22, it would have been obvious to one of ordinary skill in the art to use a difference to evaluate contiguity, since to "evaluate contiguity" for voxels can mean

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either to determine that they are contiguous or to determine that they are not contiguous. In the case of determining that voxels are not contiguous, it would have been obvious to use a difference, since contiguous voxels would have the same property by definition, and the presence of a difference in that property would indicate an absence of contiguity.

5. Claims 2-3, 5-7, 13-14, 16-18 and 20 are rejected under 35 U.S.C. § 103 as being unpatentable over the combination of Cline et al and Annis.

As to claims 2, 5, 6, 13, 16, 17 and 20, Annis teaches scanning a volume with x-rays to detect the presence of explosives (col 1, lines 63 to col 2, line 4). It would have been obvious to use the x-ray system of Cline et al to scan for explosives since Annis teaches that they exhibit recognizable characteristics of density, mass or volume (col 1, lines 51-60).

As to claims 7 and 18, Annis teaches scanning luggage for explosives (figure 2, item 40). It would have been obvious to use the x-ray system of Cline et al to scan luggage for explosives since it is a well-recognized problem that explosives may be found in luggage.

As to claims 3 and 14, it would have been obvious to use the x-ray system of Cline et al to scan for delamination of a composite material since it is known that empty spaces caused by delamination are essentially uniform in density, and Annis teaches detecting objects which exhibit recognizable characteristics of density, mass or volume (col 1, lines 51-60).

As to claim 23, it would have been obvious to one of ordinary skill in the art to use a difference to evaluate contiguity, since to "evaluate contiguity" for voxels can mean either to determine that they are contiguous or to determine that they are not contiguous. In the case of determining that voxels

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are not contiguous, it would have been obvious to use a difference, since contiguous voxels would have the same property by definition, and the presence of a difference in that property would indicate an absence of contiguity.

6. Claims 8-11 and 19 are allowable over the prior art of record. The prior art does not teach or suggest the steps of claims 8 and 19 of measuring densities of a set of voxels, determining the existence of a contiguous volume of uniform density, comparing the volume of the contiguous region to a first threshold, if the threshold is exceeded calculating the mass of the region from the volume and density and comparing the mass to a second threshold to determine if the object is of sufficient interest (ie if the second threshold is exceeded).

7. Applicant's arguments filed in response to the rejection of the claims under 35 USC § 102(b) have been fully considered but they are not deemed to be persuasive.

The claims now recite performing connectivity analysis on a target pixel by examining pixels in the same plane and in the planes above and below a given voxel.

However, the language of the claims is not specific enough to ensure that examination of the planes above and below a given pixel takes place at the same time as examination of the plane in which the given pixel lies. In other words, in Cline et al, first the neighbors of a given pixel in the same plane are examined. At a later time, after all planes have been examined, pixels belonging to planes above and below that first given pixel examined to see whether they are connected to that first given pixel. Therefore Cline et al in fact meets the language of the claims.

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Applicant further argues that an advantage of the claimed methodology is that "thin regions of any shape and any orientation can be identified." On consideration it is clear that two pixels connected diagonally would be recognized as being connected if examined in the same plane, since one would belong to the set of immediately adjacent eight-neighbors; however diagonally connected pixels might be missed if they lay in different planes, since no "overlap" between identified regions would be evident (see Cline et al, col 14, lines 17-19), in fact neither pixel by itself would have been identified as a region.

8. Claims 1-7, 12-18 and 21-23 would appear to overcome the art rejection if language were inserted indicating that the process of examining voxels for contiguity proceeded in sequential fashion, ie, all immediate neighbors of a first pixel were examined for contiguity, then all immediate neighbors of a second pixel were examined, and so forth; and further indicating that the neighbors of a given pixel to be examined consisted of exactly the 26 immediately adjacent pixels, since neglecting to inspect <sup>ANY</sup> of these immediately adjacent pixels would permit connected regions to go undetected, and inspecting any pixel beyond these 26 would permit unconnected regions to be wrongly identified as connected. (b)

9. A call was made on September 13 to Atty Glenn Law to discuss the case and propose an amendment to put the claims in condition for allowance, but a recorded message indicated that Atty Law would be unavailable from September 9th to 23rd.

10. Regarding the draftsperson's comments on the form PTO 948, the examiner did not prepare the comments and is not involved in the drawing review process on matters of form in the drawings;

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applicant may contact the Drawing Review Branch, 703-305-8404, as indicated on the form, to discuss these comments with the a reviewer.

11. Applicant's amendment necessitated the new grounds of rejection. Accordingly, **THIS ACTION IS MADE FINAL**. See M.P.E.P. § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 C.F.R. § 1.136(a).

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.


12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gerard Del Rosso whose telephone number is (703) 305-4948.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 305-8576.

The group fax number is (703) 308-6606.

gd

September 13, 1996

  
MICHAEL T. RAZAVI  
SUPERVISOR / PATENT EXAMINER  
C/O 1/2000